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Abstract

The processes and protocols for mentoring inexperienced peer reviewers is an important topic if the scientific community is to maintain high standards for empirical work. A review of the literature, interviews, and personal experience as a mentee revealed a variety of different protocols and procedures. This paper highlights the current state of the peer review process from the empirical literature, interviews, and personal experience. Results indicate that there are no established, evidence-based, protocols for training new peer reviewers.

Keywords: peer-review, peer-review process, peer-review training

Peer review is the process by which many scientific journals maintain their rigorous standards for what research is, and is not, published. Peer review typically involves a review, often with identifying information removed (called blinding), by two or more researchers familiar with the subject matter. The peer review process fosters confidence in the research findings through expert review. Such confidence is built upon the reviews of members of the scientific community, who "evaluate the scientific rationale and significance of the questions/hypotheses, strengths and weaknesses of the study design and methods, the quality and originality of the data, and the key

findings" (Seals & Tanaka, 2000, p. 52). Jefferson, Wager, and Davidoff (2002) summarize the importance of peer review:

> A fundamental tenet of all scientific and scholarly work is that every aspect of it must be subjected to critical appraisal; only those findings and principles that withstand such appraisal become established. Although much appraisal occurs as work is in progress (and some after it has been published), work that is submitted for publication undergoes critical appraisal, known as peer review, as part of the editorial process (p. 2786-2787).

This process may vary across different disciplines. Bachand and Sawallis (2003) explored variations in the peer review process of 18 different fields of study, these variations included pay of peer reviewers, type of blinding used (e.g., single-blind, double-blind, and open review), and inclusion of peer reviews with the published article. Despite these variables, however, the task of reviewers within the peer review process remains relatively consistent across disciplines.

As reviewers are an integral part of the peer review process, this paper explored how peer review is taught to inexperienced reviewers. A literature review examined the current state of peer review in the empirical literature. Next interviews were conducted with experienced reviewers. Lastly, the literature and interview results are compared together with the first author's experience in learning to conduct peer review.

Summary of the Current Literature

A review of the somewhat limited empirical literature addressing peer review suggests that the research takes place largely in classroom settings both at the undergraduate (Guilford, 2001; Rangachari, 2010) and graduate level (Lightfoot, 1998; Felder, Stong, & Ronald, 2009). Only a single study has been conducted on the efficacy of providing mentorship for experienced reviewers (Houry, Green, & Callaham, 2012).

Classroom training procedures varied across studies. For example, Lightfoot (1998) included a mixed class of 26 undergraduate and graduate students that reviewed other student's critiques of an article published within the class' field of study. Each student acted as both an author and as a reviewer of another student's work at three different points of the term. Alternatively, Felder, Strong, and Ronald (2009) describe a graduate class review of an article that was overseen from submission to acceptance. The class' reviews were collected, compiled with the assistance of a faculty member and experienced reviewer, and submitted to the author directly. One of the students stated that the direct feedback to the author "increased the level of accountability" (p. 224).

Unique to Lightfoot (1998) was the inclusion of different types of peer-review systems in addition to double-blind (i.e., both reviewers and authors are anonymous). Double-blind was preferred by most students as it "removed most of the hesitation toward a critical review of a peer's work" (Lightfoot, 1998, p. S60). The inclusion of other blinding procedures is more analogous to those used in many peer-reviewed journals where editors are likely to not be blinded and reviewers may or may not be blinded (Justice et al., 1998). Guilford (2001) also conducted an experiment within the context of a classroom of 39 undergraduate students, but used exclusively a double-blind

approach with a heavy emphasis on anonymity. Students acted as both an author through a first and second draft, and as a reviewer for two peer's first drafts. Their grades were dependent exclusively on quality of their reviews and the final draft of their own paper. Taken together the classroom literature presented varied procedures for training student reviewers and used varied methods to measure results, precluding clear empirical recommendations for classroom learning arrangements.

In the single study assessing non-student reviewers, Houry, Green, & Callaham, (2012) examined the effectiveness of mentoring new peer reviewers to improve review quality outside of the classroom. The subjects of the study all had previous experience as authors with a median of 3 first author publications in the control group, and 4 first author publications in the mentored group. Results from this study indicated that mentoring had little to no effect on the quality of reviews produced by these reviewers as judged by the editors on an already established 5-point rating scale. Initially, the fact that all of these reviewers had a fair amount of experience with the peer-review process and approximately 30% had experience as a reviewer with a different journal, seems to imply that differences between the two groups may be harder to determine given their high level of experience with the process. However, the discussion section addresses this by stating that according to their scale there was still detectable room for improvement.

Navalta & Lyons (2010) looked at stringency (i.e., ratio of paper rejected to accepted) of reviews in comparison to level of experience (i.e., faculty member versus graduate student). The context was a student journal where both students and faculty members acted as reviewers for student submitted manuscripts. Results compared the final recommendation from students versus faculty members and found that student's recommendations were as stringent as faculty members. These findings did not take into account reviewer feedback, only level of agreement between experienced (faculty member) reviewers, and inexperienced (student) reviewers. Explanations for the results point to a set of published guidelines for reviews provided to all students (Simpson, 2008) and that student reviewers were encouraged to find a faculty member to mentor them, however, these variables were not accounted for systematically.

In sum, the research reviewed revealed little in terms of firm guidelines for teaching new reviewers. Results from classroom exercises (Guilford, 2001; Rangachari, 2010; Lightford, 1998) were drawn from surveys given to students that assessed how beneficial they had felt the exercise to be, with one article citing a low survey return of 35% (Lightfoot, 1998). Results did not discuss improvement in student's writing or any measurement system to determine an increase in reviewer quality due to the exercise. Guilford (2001) provided results measured using a pre- and post-test and citing an improvement of the average grade over a comparable term paper using a traditional approach the year before of 7.2%. These results do not directly indicate a specific improvement in the performance of the reviewer, but instead to improvement in the overall writing style of the class. Results from the articles reviewed show that conclusions are either somewhat mixed on the outcome of such training (Houry et al., 2012; Navalta & Lyons, 2010) or that the researchers did not directly assess the efficacy of training (Lightfoot, 1998; Guilford, 2001).

Interviews

Participants and Setting

Given the nascent state of research on peer review several interviews were conducted and summarized regarding three faculty member's processes for teaching new or inexperienced peer-reviewers. All three interviews took place at a private university in the southeastern United States. Interviewees were selected based upon two criteria: having experience as researchers and reviewers and providing training in some fashion to potential or existing reviewers. The interviewees chosen were faculty members in the lead author's area of study. Participant one was a male associate professor who completed his PhD in 2006. At the time of the interview he had published 18 peer reviewed articles and served on the editorial board for 7 years for 3 journals in the field of behavior analysis. He stated that he had mentored several new reviewers in his career.

Participant two was a female assistant professor who completed her PhD in 2009. At the time of the interview she had published 12 peer reviewed articles and served on the editorial board for 4 years in 2 journals in the field of behavior analysis. She stated that she had mentored several new reviewers in her career.

Participant three was a male associate professor who completed his PhD in 2008. At the time of the interview he had published 28 peer reviewed articles and served as an associate editor for 2 years for 1 journal in the field of behavior analysis. He stated that he had been mentored and had a perspective doctoral student he was preparing to mentor as a reviewer.

Interview Format

Participants were interviewed individually in their offices. Interviews were conducted in a single session lasting approximately one hour. The participants were first asked what population they had mentored (undergraduates, graduate students, or anonymous reviewers in the peer review process). If the participants indicated graduate students, a follow-up question was asked to determine whether the students were masters or doctoral-level students. Participants were then asked if the mentoring they provided was conducted in groups, individually, or in distance formats. Participants were then asked to describe the procedure used in the format they indicated. Participants were asked follow-up questions as necessary to identify the level of formality (i.e., how structured the process was), the amount of practice, if any, they considered necessary before real peer review could be attempted, materials used, how feedback was provided, if they used a time spent or criteria base for new reviewers. Participants were also asked to describe the process by which they were trained to conduct peer review.

From the interviews, themes were identified by analyzing word repetitions. After the interviews were conducted, transcripts were reviewed for both individual word and word combinations. Words, and word combinations appearing most often were identified and then the context they were identified was assessed for meaning.

Results

All participants interviewed had in some way, either through their experience as an editor or with their own students, mentored or advised someone through reviewing a manuscript. The process varied depending on context. For those functioning as editors and bringing in less experienced reviewers, participant two indicated that they would request an additional (i.e., not needed)

reviewer for the article and then judge the final review for it's contribution and decide whether it should be submitted or not. Participant one stated that for every manuscript for which they were the assigned editor they would include a student as a standard reviewer. Both described their interactions with the reviewer as being informal but with multiple interactions before reaching a final product. They both cited giving the most feedback on writing style and tone. Participant one specifically stated in closing that his biggest concern with new reviewers was "a tendency to be too abrasive." They stated it might be due to "a lack of experience receiving critical feedback on their own work."

Outside of the formal reviewer-editor relationship, participant two described a learning opportunity she provided to members of her research laboratory. As an editor of a blinded journal, the interviewee would request permission to share a manuscript with her lab members and allow them each to write a review. Guidelines and feedback were provided, though less formally and with fewer interactions than other contexts described previously. Once the lab members finished reviewing the articles, the interviewee would compare the feedback generally given by experienced reviewers to the feedback given by the students and provide them feedback on details that were caught or missed, and the general tone or writing style.

Of those interviewed only one, participant three, had not yet assisted a mentee through the reviewer process. However, his feedback on how he was trained during his first reviews is similar to that of participant one's procedure for mentoring selected student reviewers. Specifically, they had been given the opportunity to act as a guest reviewer while being overseen by a more experienced writer and reviewer. The first draft was reviewed by the mentor and returned, edits were made or discussed and a final review was submitted. The interviewee emphasized the informality of the relationship. Participant two describes being mentored in a similar way by an associate editor. She was first "asked to review manuscripts on topics with which [she] knew very well" and was given feedback on these. "[Participant two's] first official review was included by the associate editor, but he gave [a] detailed critique."

As an additional insight into training the peer-review process, participant two was an associate editor-in-training for a peer-reviewed journal at the time of the interview. For this journal the associate editor assigns and reads reviews from ad hoc reviewers, summarizes the reviews, provides her own feedback, and makes publishing decisions. Differences from mentor to mentor in the editorial training process were described as similar to those found in reviewer training and mentorship. In a similar fashion to how faculty trained the peer reviewer, the steps of initially consistent feedback fading to minimal input when needed also appears in this journal's associate editor training process. The interviewee expressed a desire for a more formalized set of steps, mastery criterion, and a regularly updated handbook to which they could refer while learning to be an associate editor. Similarly, participant one indicated the difficulty of setting formalized steps and mastery criterion for reviewers, stating "just finding errors in a document is not an appropriate measure because it doesn't take into account issues with a document as a whole."

Two themes were identified from the interviews. First, a mentored experience theme emerged. All of the participants indicated the importance of training new reviewers. All three interviewees stressed that some form of training, typically in a back-and-forth mentorship model was necessary for new reviewers. Specifics of what constitutes mentoring and how much is needed was not

consistent across interviewees. A competence theme also emerged. All participants indicated in one manner or another that it was not enough simply to provide some training, but that participants needed to be trained to criteria. None of the participants indicated specific criteria, only that informal new reviewers had to meet their personal informal criteria before a review would be accepted. The nebulous nature of this theme (criteria needed but not specified) may be due to difficulty associated with operationally defining what a good review looks like.

Discussion

Personal Experience

The first author, a graduate student in behavior analysis, was asked to provide a guest-review of a manuscript by a faculty member for a student journal. Before beginning graduate coursework, I had minimal experience writing for academic work, with the anecdotally typical exposure to writing in my undergraduate training. Due to coursework and personal interest, I had regularly accessed research literature, specifically related to behavior analysis. I was provided the opportunity to assist as a guest reviewer on the student journal due to a specific, personal area of interest that related to the manuscript. The faculty member that was acting as primary reviewer provided guidelines for critical features to look for and specific areas that feedback would be most beneficial. I was provided direction on the possible outcomes reviewers could give for this particular journal, level of detail needed for reviewing the manuscript, and was instructed to reach my own accept, reject, or resubmit decision. A draft of the review was submitted to the primary reviewer. Feedback was provided to me both in writing and verbally during a brief meeting. During the meeting the lead reviewer reviewed the edits and I rewrote the review and resubmitted it to the primary reviewer for final revisions. I met with the faculty member one final time where we reviewed the manuscript decision before submission.

As a naive reviewer I benefited from this type of mentorship process through direct experience with reading and providing feedback on a manuscript and knowledge of the peer-review process from the reviewer side. Exposure to this side of the process was valuable as a writer as it entailed learning what reviewers are looking for when they review a manuscript. Additionally, the experience provided the opportunity to receive multiple critiques on my review from an experienced reviewer on both writing skill and thoroughness of feedback. As a guest-reviewer being mentored and working closely with a primary, experienced, reviewer I was provided an environment to learn about the peer-review process with direct supervision and feedback provided at every step. This resulted in mistakes being caught quickly so corrective feedback could be delivered.

Conclusion

Current research and interviews from faculty indicate limited assessment on the effectiveness of the various protocols for training peer reviewers. Where such research has been conducted there are issues with experimental control and how results are gathered and interpreted; such issues make this topic difficult, but not impossible.

Interestingly, the most frequently used tools of the reviewed studies do not appear to have been tested individually (Navalta & Lyon, 2010; Houry, Green, & Callaham, 2012). These tools include written lists, instructional videos, or online training modules. Currently, there are multiple available lists and instructional articles on writing reviews (Seals & Tanaka, 2000; Annesley, 2013; Simpson, 2008). Research could compare giving an instructional list versus providing examples and non-examples, or interactive modules and opportunities to review a pre-reviewed document. Such training is equally open to inquiry regarding effectiveness and efficacy for teaching new reviewers. Navalta & Lyon emphasized the benefit of training reviewers in their results:

> In recent years, there has been an emphasis on teaching the peer review process in the classroom and simulating the journal review experience. It is possible that the incorporation of teaching strategies aimed at exposing students to the peer review process, along with tangible opportunities such as are provided by *International Journal of Exercise Science*, are enabling students to be better prepared when performing scholarly assessments (p.172).

The personal experience of the lead author echoes the themes found in the faculty interviews. When examining both the interviews and the available literature, mentorship and instruction that provide regular interaction and critical feedback is an accepted practice for training those new to reviewing the work of peers. The methods through which this is done are varied but include access to a mentor, at least one contact with that mentor, and delivery of constructive feedback on their work. Across relevant cited studies, anecdotal experiences, and interviews there was no cohesive or consistent mastery criterion identified.

Between the current available literature, faculty interviews, and anecdotal experience, there is no clear best practice for training peer reviewers. This is in no way meant to imply that these training procedures hold no importance, only that they are diverse, difficult to compare, and results are complicated to interpret. Research into training procedures and materials should continue, as skilled reviewers are a vital part of the peer review process.

References

Bachand, R. G. & Sawallis, P. P. (2003). Accuracy in the identification of scholarly and peer-reviewed journals and the peer-review process across disciplines. *The Serials Librarian: From the Printed Page to the Digital Age, 43* (2), 39-59.

Felder, P., Strong, T., & Ronald, J. (2009). Insider experiences of The Qualitative Report's reviewing process. *The Weekly Qualitative Report, 2* (38), 221-227.

Guilford, W. H. (2001). Teaching peer review and the process of scientific writing. *Advances in Physiology Education, 25* (3), 167-175.

Houry, D., Green, S., & Callaham, M. (2012). Does mentoring new peer reviewers improve review quality? A randomized trial. *BMC Medical Education, 12*, 83.